

REMARKS

This paper is submitted in response to the pending Office Action mailed on February 26, 2008. Because this Response is submitted with a certificate in compliance with 37 C.F.R. §1.8 on or before the shortened period for reply set to expire on **May 26, 2007**, this Response is timely filed.

I. STATUS OF THE CLAIMS

Prior to this Response, claims 1, 2 and 6 to 15 were pending with claims 3 to 5 having been canceled without disclaimer in response to a Restriction Requirement. By this Response, claim 1 has been amended and claim 8 has been canceled without disclaimer. None of the remaining claims have been amended or canceled, and no new claims have been added. Thus, claims 1, 2, 6, 7 and 9 to 15 are pending and at issue in this application.

While Applicant believes that no additional fees are due in connection with this application, Applicant directs the Office to charge **Deposit Account No. 23-1925 (11955-00009)** for any fees deemed owed during the pendency of this application, excluding the issue fee.

II. CLAIM REJECTIONS

The Office Action rejects claims 1, 2 and 6 to 15 under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,727,607 to Lee et al. ("Lee") in view of Japanese Patent Publication No. JP 09-163708 to Isamu ("Isamu").

Applicant respectfully traverses the obviousness rejection of claims 1, 2 and 6 to 15 as obvious over the combination of *Lee* and *Isamu*. In particular, Applicant submits that the relied upon combination fails to teach, disclose or even suggest each and every element set forth in the pending claims. Thus, the relied upon combination cannot provide a basis for a *prima facie* case of obviousness. For example, amended independent claim 1 recites, in relevant part, a rotary actuator that includes a stator having plural permanent magnets, a rotor having a rotor core which two salient poles are formed at, and one or more rotor coils are wound around, an electro-magnetic torque generating portion comprising the stator and the rotor between which electro-magnetic torque is generated by supplying an electric current

to the rotor coils, which, in approximate proportion to the magnitude of the electric current, displaces a relative angle position of the rotor and the stator, and an elastic member biased in approximate proportion to the magnitude of the relative angle displacement of the rotor and the stator and thereby generating a torque in the direction opposite to the direction of the electro-magnetic torque, wherein the permanent magnet having two circumferential end portions and one circumferential center portion, and the radial thickness of the permanent magnet at the circumferential end portions being smaller than the radial thickness of the permanent magnet at the circumferential center portion, wherein the distance from the radial outline of the circumferential center portion of the salient pole to the rotation center of the rotor core being smaller than the distance from the radial outline of the circumferential end portions of the salient pole to the rotation center of the rotor core, and wherein the angle between the line connecting one of circumferential outlines of a salient pole and the rotation center of the rotor core and the line connecting the other circumferential outline of the same salient pole and the rotation center of the rotor core being an obtuse angle. In other words, amended independent claim 1 discloses and recites a rotary actuator that is configured, and includes a structure, to provide a substantially constant electro-magnetic torque throughout a wide angular range defined by the rotation of the rotor relative to the stator and the plural permanent magnets disposed therewith.

Lee does not disclose, teach or suggest each and every element recited in the claims. Lee simply discloses an oscillating reluctance motor that includes a rotor having a center on which a rotational shaft is fixed thereto, and a pair of teeth protruding from said rotational shaft and arranged in positions opposite to each other; a stator in which a cylindrical space is formed so that the rotor can rotate and first and second winding parts are formed, rotation control means which is installed between the rotor and a stator to control rotation of the rotor, wherein a first winding coil is wound on the first winding part, a second winding coil is wound on the second winding part and the first winding part and the second winding part are formed having an angle centering around the rotational shaft as a pair so that the rotor can perform periodical rotation movement. Lee does not disclose, or even contemplate

the rotor and stator configuration recited in amended independent claim 1. For example, *Lee* does not disclose or suggest a permanent magnet portion of the stator, much less that the permanent magnet portion of the stator includes two circumferential end portions and one circumferential center portion, and the radial thickness of the permanent magnet at the circumferential end portions being smaller than the radial thickness of the permanent magnet at the circumferential center portion. Moreover, *Lee* does not disclose or suggest that the distance from the radial outline of the circumferential center portion of the salient pole to the rotation center of the rotor core being smaller than the distance from the radial outline of the circumferential end portions of the salient pole to the rotation center of the rotor core, or that the angle between the line connecting one of circumferential outlines of a salient pole and the rotation center of the rotor core and the line connecting the other circumferential outline of the same salient pole and the rotation center of the rotor core being an obtuse angle. Because *Lee* utilizes a structure similar to the one illustrates in FIG. 5, the magnetic-torque developed between the windings 104 (104a, 104b) of the stator 101 and the rotor teeth 102a of the rotor 102 will vary, i.e., not remain substantially constant, throughout a wide angular range defined by the rotation of the rotor relative to the stator.

Isamu does not provide or disclose the teaching or disclosure missing from *Lee*. *Isamu* discloses a permanent magnet type rotary actuator that includes a pair of permanent magnets, each of which is configured and arranged to define a semi-circular arc. Moreover, the thickness of the end portions of each of the permanent magnets of *Isamu* may be different from the thickness of central portion of each of the permanent magnets. However, *Isamu* is completely silent regarding the shape or configuration of the rotor. In particular, *Isamu* does not disclose or suggest that the distance from the radial outline of the circumferential center portion of the salient pole to the rotation center of the rotor core being smaller than the distance from the radial outline of the circumferential end portions of the salient pole to the rotation center of the rotor core, or that the angle between the line connecting one of circumferential outlines of a salient pole and the rotation center of the rotor core and

the line connecting the other circumferential outline of the same salient pole and the rotation center of the rotor core being an obtuse angle.

Because neither *Lee* nor *Isamu* discloses or even suggests the shape or configuration of the rotor much less the shape or configuration of the rotor relative to the stator, no combination or modification of these references would provide or include this configuration or feature. Thus, the combination of *Lee* and *Isamu* cannot establish a *prima facie* case obviousness because it fails to disclose each and every element recited in the claims 1, 2, 6, 7 and 9 to 15. For at least these reasons, Applicant submits that the claims 1, 2, 6, 7 and 9 to 15 are patentable and in condition for allowance.

III. CONCLUSION

For the foregoing reasons, Applicant respectfully requests withdrawal of the pending rejections and submits that the above-identified patent application is now in condition for allowance and earnestly solicits reconsideration of same. The Examiner is respectfully requested to telephone the undersigned if he can assist in any way in expediting prosecution of this application.

Respectfully submitted,
BRINKS HOFER GILSON & LIONE

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